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**CERTIFICATE OF MAILING PURSUANT TO C.F.R. §1.8**

I hereby certify that this Request for Certificate of Correction is being deposited with the United States Postal Service this date, in an envelope addressed to Certificate of Correction Branch, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

Date: 5-12-2005 By: Julie A. Eslick
Signature of Person Depositing Mail



| IN THE UNITED STATES PATENT AND TRADEMARK OFFICE<br>*-- PATENT --* | | | |
|---|---|---|---|
| Patentee: | Osamu KAJINO, et al. | Docket No: | 28569.8200 |
| Serial No.: | 09/778,421 | Filed: | Feb. 7, 2001 |
| Patent No.: | US 6,876,606 B2 | Issued: | April 5, 2005 |
| Title: | MOTOR CONTROL APPARATUS, DISK APPARATUS & ACCELERATION DETECTION DEVICE | Examiner: | M. Edun |
| | | Conf. No.: | 6898 |

## REQUEST FOR CERTIFICATE OF CORRECTION

Certificate of Correction Branch
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Honorable Commissioner:

Under 37 C.F.R. §1.322, Patentee requests a Certificate of Correction be issued to correct the following clerical or typographical errors, which were made by the U.S. Patent and Trademark Office.





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**In the Claims:**

Claim 7 should read as follows:

7. A motor controlling device according to claim 5, wherein:

the acceleration detector includes a digital filter for receiving the rotation speed N(n) of the motor and outputting an average rotation speed **N'(n)**, and

the differential calculator calculates the acceleration A(i) using the average rotation speed N'(n) instead of the rotation speed N(n).

Claim 8 should read as follows:

8. A motor controlling device according to claim 12, wherein the digital filter calculates the average rotation speed N'(n) by expression (3):

$$N'(n) = (N(n) + (m-1) \cdot N'(n-1))/m \quad \text{..... expression (3)}$$

where m is a positive integer.

A copy of the claims from the last Response to Office Action, before they were renumbered, is enclosed. Claim 7 (formerly claim 12) should not have a space in the highlighted N'(n) above. Also, in Claim 8 (formerly claim 13) there should be a slash (/) before the final m in the expression (3). Therefore, Registrant respectfully requests that the Patent Office grant this Request and issue a Certificate of Correction with the corrections to Claims 7 and 8 as shown above. **Under the provisions of C.F.R. §1.322, there is no fee for the Certificate of Correction due to the error having been made by the U.S. Patent and Trademark Office. However, if it is found that a fee is due, the Office is authorized to charge Deposit Account No. 19-2814 and to advise the undersigned accordingly.**

If there are any questions or unresolved issues, the undersigned would welcome a telephone call to the number shown below.

Respectfully submitted,

By _____

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**CERTIFICATE OF FACSIMILE/MAILING PURSUANT TO 37 C.F.R. §1.8**

I hereby certify that this correspondence, along with any accompanying documents, pursuant to 37 C.F.R. §1.8, are being sent via facsimile to (703) 872-9306 with a confirmation copy deposited with the United States Postal Service via First Class mail addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: Sept. 23, 2004 By: _____

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
PATENT

| | | | |
|---|---|---|---|
| Inventor(s): | Osamu KAJINO et al. | Docket No.: | 28569.8200 |
| Assignee(s): | Matsushita Electric Industrial Co., Ltd. | | |
| Serial No.: | 09/778,421 | Filing Date: | February 7, 2001 |
| | | Examiner: | Mohammad N. Edun |
| TITLE: | MOTOR CONTROL APPARATUS, DISK APPARATUS & ACCELERATION DETECTION DEVICE | Art Unit: | 2655 |

**RESPONSE TO OFFICE ACTION**

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Honorable Commissioner:

In response to the Office Action dated June 23, 2004, please consider the following amendments and remarks:

## IN THE CLAIMS

Please amend claims 17-19, 23, and 24 and cancel claims 16, 22, and 26 without disclaimer or prejudice as follows:

1. (ORIGINAL) A motor controlling device, comprising:

an acceleration detector for detecting an acceleration of a motor;

a motor driver for supplying a driving current to the motor;

a heat quantity calculator for calculating a heat quantity generated in the motor at least based on an output from the acceleration detector; and

a motor controller for controlling the motor driver based on the heat quantity.

2. (ORIGINAL) A motor controlling device according to claim 1, wherein:

the acceleration detector includes:

a movement distance indicating device for detecting a prescribed movement distance of the motor; and

a timer for counting a time period required for the motor to move the prescribed movement distance, and

the acceleration detector calculates the acceleration based on an output from the movement distance indicating device and an output from the timer.

9 3. (ORIGINAL) A motor controlling device according to claim 1, wherein the heat quantity calculator stores the relationship between the acceleration and the heat quantity, and calculates the heat quantity at least from the acceleration which is output from the acceleration detector based on the relationship.

10 4. (ORIGINAL) A motor controlling device according to claim 1, wherein the heat quantity calculator calculates the heat quantity at least based on a first value obtained by multiplying a square of the acceleration by a first constant.

11 ~~5.~~ (ORIGINAL) A motor controlling device according to claim 4, further comprising an inertia determiner for determining an inertia of a load when the motor is driven, wherein the first constant is changed by an output from the inertia determiner.

3 ~~6.~~ (ORIGINAL) A motor controlling device according to claim 2, wherein:

the acceleration detector calculates a prescribed rotation distance by multiplying the prescribed movement distance by a prescribed integer, and

the heat quantity calculator calculates the heat quantity at least based on a sum of a first value obtained by multiplying a square of the acceleration by a first constant and a second value obtained by multiplying the prescribed rotation distance by a second constant.

4 ~~7.~~ (ORIGINAL) A motor controlling device according to claim 6, further comprising an inertia determiner for determining an inertia of a load when the motor is driven, wherein the first constant is changed by an output from the inertia determiner.

12 8. (ORIGINAL) A motor controlling device according to claim 1 wherein the accelerator detector includes:

a movement distance indicating device for detecting a prescribed movement distance of the motor and generating a pulse at each prescribed movement distance,

a timer for counting a time duration between generations of the pulses, and

a speed calculator for calculating a speed of the motor from the time duration each time the motor moves a prescribed rotation distance which is obtained by multiplying an integer the prescribed movement distance,

wherein the acceleration detector calculates the acceleration from the speed.

13 9. (ORIGINAL) A motor controlling device according to claim 8, wherein the prescribed rotation distance is equal to a value obtained by multiplying by an integer the rotation distance corresponding to one rotation of the motor.

10. (ORIGINAL) A motor controlling device according to claim 2, wherein the acceleration detector includes:

a movement distance indicating device for generating a pulse each time the motor moves a prescribed angle D,

a speed calculator for calculating a rotation speed N(n) of the motor by expression (1) each time the movement distance indicating device generates the n'th pulse, and

a differential calculator for calculating an i'th acceleration A(i) by expression (2) each time j pulses are generated:

$N(n) = D/\Delta tp(n)$ ..... expression (1)

$A(i) = (N(j \cdot i) - N(j \cdot (i-1)))/\Delta t(i)$ ..... expression (2)

where n, i and j are positive integers, $\Delta tp(n)$ is a time duration between the time when the n'th pulse is generated and the time when the (n-1)th pulse is generated by the movement distance indicating device, and $\Delta t(i)$ is a time duration between the time when the $(j \cdot i)$th pulse is generated and the when the $(j \cdot (i-1))$th pulse is generated by the movement distance indicating device.

11. (ORIGINAL) A motor controlling device according to claim 10, wherein j is a value obtained by multiplying by an integer the number of pulses which are generated by the movement distance indicating device while the motor rotates once.

12. (ORIGINAL) A motor controlling device according to claim 10, wherein:

the acceleration detector includes a digital filter for receiving the rotation speed N(n) of the motor and outputting an average rotation speed N'(n), and

the differential calculator calculates the acceleration A(i) using the average rotation speed N'(n) instead of the rotation speed N(n).

13. (ORIGINAL) A motor controlling device according to claim 12, wherein the digital filter calculates the average rotation speed N'(n) by expression (3):

$N'(n) = (N(n) + (m-1) \cdot N'(n-1))/m$ ..... expression (3)

where m is a positive integer.

14. (ORIGINAL) A motor controlling device according to claim 1, wherein:

the motor controller includes:

a temperature calculator for calculating at least one of a temperature change of the motor and a temperature change of a driven target of the motor based on the heat quantity calculated by the heat quantity calculator, and

a current controller for restricting a driving current which is output by the motor driver, and

when the temperature change exceeds a prescribed threshold level, the motor controller sets a restriction value of the driving current.

15. (ORIGINAL) A motor controlling device according to claim 14, wherein the restriction value is changed in accordance with an amount by which the temperature change exceeds the prescribed threshold level.

16. (CANCELED).

16 17. (CURRENTLY AMENDED) A disk apparatus, comprising: ~~according to claim 16,~~

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which recording of information to the disk or reproduction of information from the disk by the optical head is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

17 ~~18.~~ (CURRENTLY AMENDED) A disk apparatus, comprising: ~~according to claim 16,~~

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation speed of the motor is maintained at the intended rotation speed;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which recording of information to the disk or reproduction of information from the disk by the optical head is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

18 ~~19.~~ (CURRENTLY AMENDED) A disk apparatus, comprising: ~~according to claim 16, further comprising:~~

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a speed calculator for calculating a rotation speed of the motor;

a determiner for determining whether or not the rotation speed of the motor is within a range in which recording of information to the disk or reproduction of information from the disk by the optical head is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current;

an acceleration detector for detecting an acceleration of the motor,

a heat quantity calculator for calculating a heat quantity of the motor at least based on the acceleration which is output by the acceleration detector, and

a temperature calculator for calculating a temperature change in a prescribed area of the disk apparatus based on the heat quantity,

wherein the determiner determines whether or not the temperature change is equal to or less than a prescribed threshold level,

when the determiner determines that the temperature change is equal to or less than the prescribed threshold level and that the rotation speed of the motor is within the range, the motor controller restricts the driving current, and

when the determiner determines that the temperature change is more than the prescribed threshold level, the motor controller restricts the driving current.

19 20. (ORIGINAL) A disk apparatus according to claim 19, wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases.

20 21. (ORIGINAL) A disk apparatus according to claim 19, wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation, speed of the motor is maintained at the intended rotation speed.

22. (CANCELED).

21 23. (CURRENTLY AMENDED) A disk apparatus, comprising: ~~according to claim 22,~~

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current wherein the motor controller sets the restriction value of the driving current to be higher as an intended rotation speed of the motor increases;

a synchronous clock generator for generating a synchronous clock based on a reproduction signal which is read from the disk by the optical head;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which generation of the synchronous clock is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

22 24. (CURRENTLY AMENDED) A disk apparatus, comprising: ~~according to claim 22,~~

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current wherein the motor controller sets the restriction value of the driving current to be higher than the restriction value at the time of a start of an acceleration of the motor, before the rotation speed of the motor is maintained at the intended rotation speed;

a synchronous clock generator for generating a synchronous clock based on a reproduction signal which is read from the disk by the optical head;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the rotation speed of the motor is within a range in which generation of the synchronous clock is possible,

wherein when the determiner determines that the rotation speed of the motor is within the range, the motor controller restricts the driving current.

23 25. (ORIGINAL) A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

a speed calculator for calculating a rotation speed of the motor; and

a determiner for determining whether or not the optical head is recording information to the disk or reproducing information from the disk, and whether or not the rotation speed of the motor has changed,

wherein when the determiner determines that the optical head is not recording information to the disk or reproducing information from the disk and that the rotation speed of the motor has changed, the motor controller restricts the driving current.

26. (CANCELED).

24 27. (ORIGINAL) A disk apparatus, comprising:

a motor for rotating a disk;

an optical head for recording information on the disk or for reproducing information from the disk;

a motor driver for supplying a driving current to the motor;

a motor controller for setting the driving current;

an acceleration detector for detecting an acceleration of the motor;

a heat quantity calculator for calculating a heat quantity of the motor at least based on the acceleration which is output by the acceleration detector;

a temperature calculator, for calculating a temperature change in a prescribed area of the disk apparatus based on the heat quantity; and

a determiner for determining whether or not the temperature change is equal to or more than a prescribed threshold level,

wherein when the determiner determines that the temperature change is equal to or more than the prescribed threshold level, the motor controller restricts the driving current.

25 28. (ORIGINAL) A speed detection device, comprising:

a movement distance indicating device for generating a pulse each time a motor moves a prescribed movement distance;

a timer for counting a time duration between generations of the pulses; and

a speed calculator for calculating a speed of the motor based on the time duration each time the motor rotates a prescribed rotation distance which is obtained by multiplying by an integer the prescribed movement distance,

wherein the prescribed rotation distance is equal to a value obtained by multiplying by an integer a rotation distance corresponding to one rotation of the motor.

26 29. (ORIGINAL) An acceleration detection device, comprising:

a speed detection device according to claim 28, wherein an acceleration is calculated from the speed.

## REMARKS

The Office allows claims 1-15, 25, and 27-29, rejects claims 16, 22, and 26, and objects to claims 17-21, 23, and 24. Applicant cancels claims 16, 22, and 26 without disclaimer or prejudice and amends claims 17-19, 23, and 24. Claims 1-15, 17-21, 23-25, and 27-29 (9 independent claims; 26 total claims) remain pending in the application.

The Office objects to claims 17-21, 23, and 24 and indicates that claims 17-21, 23, and 24 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims. Claims 17-19, 23, and 24 have been amended to include all of the limitations of the base claim and any intervening claims. Claims 20 and 21 have not been amended, because they now depend from an allowable base claim, namely claim 19. Thus, claims 17-19, 23, and 24 are allowable as amended and claims 20 and 21 are allowable as dependent upon an allowable base claim.

Support for the various amendments may be found in the originally filed specification, claims, and figures. No new matter has been introduced by these amendments. Reconsideration of this application is respectfully requested.

## 35 U.S.C. §102 REJECTIONS

The Office rejects claims 16, 22, and 26 under 35 U.S.C. §102(e) as allegedly being anticipated by Koudo.[1]

Applicant cancels claims 16, 22, and 26, so that the rejection of these claims is moot. Applicant respectfully requests withdrawal of this rejection.

[1] U.S. Patent No. 6,445,657, issued September 3, 2002.

## CONCLUSION

Thus, the Applicant respectfully submits that the present application is in condition for allowance. Reconsideration of the application is thus requested. Applicant invites the Office to telephone the undersigned if he or she has any questions whatsoever regarding this Response or the present application in general.

Respectfully submitted,

By: S. Shah 9-23-04
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Reg. No. 45,875

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